ECOREGION CLASSIFICATION WITH CLIMATE FACTORS AND FOREST FIRE

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Ecoprovince and Ecoregion

The Republic of Korea is a peninsula country with two distinct mountain systems. Since relief and distance to the ocean are major causes of spatial differentiation, regional climate in the peninsula is peculiar to the regional geography and topography. Such characteristics as well as ecosystem linkage and cultural property are important to biodiversity conservation and ecosystem management. Landforms of Korea have been developed after the pattern of mountain ranges and water systems, which are also an ecological and cultural network.

The criteria of ecoprovince classification were ecosystem connectivity and cultural homogeneity. Connectivity, the spatial distribution of similar ecosystems, affects not only the way in which natural disturbances affect ecosystems but also how well members of many populations and genes of some species are distributed over time. Ecoregions were classified by cluster analysis. The variables used in the analysis were latitude, longitude, seasonal mean temperature, and seasonal precipitation measured at 28 weather forecast offices and 40 weather observation stations for 30 years from 1961 to 1990.

Korea was divided into five ecoprovinces, 16 ecoregions. The differences in mean temperature between ecoregions were high (6.2°C: -3.0° to +3.2°) in winter and small (1.9°C: 22.3° to 24.2°) in summer. Seasonal precipitation varied greatly between ecoregions.

The ecoprovince is a useful unit for expressing the distributions of animals. Some natural, icon Korean mammals like the Manchurian black bear, Amur goral and Korean musk deer are found only in the mountainous ecoprovinces. Some endemic fishes of Korea inhabit a limited number of ecoprovinces. The ecoregion is a useful unit to express climate regime as well as the distributions of mushrooms and the frequency and scale of forest fires. Some ecoregions present several problems for biodiversity conservation and some have high biodiversity potentials.

Kangwon Ecoregion and Fire Management

Kangwon Ecoregion is located the centre of the east coast of the Korean Peninsula. It is cool in summer and warm in winter. The ecoregion receives most of its precipitation in autumn and winter, with very little in spring and summer. It has frequent and large forest fires and is a major producer of pine mushrooms.

Kangwon Ecoregion experienced the biggest forest fire on record in Korea during the spring of 1996, and this was exceeded by a fire in 2000, which was six times bigger. After the fire in 2000, NGOs (non-governmental organizations) for environmental conservation as well

as governmental organizations were disturbed. The passional willingness of these groups to participate in and to contribute to the restoration of the burned forests presented some problems for the planning process. Conventional planning processes were not able to deal these problems; a partnership between the organizations is needed. Ecosystem management strategies are logical ways to deal with this situation.

The Korea Forest Research Institute established a comprehensive and integrated study group of scientists from the fields of fire damage, vegetation, regeneration, forest soils, erosion control, hydrology, plant resources, animal resources, disease, pests, pine mushrooms, sociology, landscape and scenery, forest roads, economy and agroforestry. The 176 scientists were recommend ed by the Korea Forest Service, Ministry of Environment, local government and NGOs. Following their investigation of the burned areas – three months of field study and four months for analysis – the group developed relatively concrete principles and plans for restoration of degraded forest areas.

We can rehabilitate ecosystems and dependent species that have been adversely affected through fire exclusion, fragmentation or other results of human activities if we grow to understand the natural processes that species and ecosystems have co-developed with, and then mimic those processes through ecosystem management. Grazing can also interact with fire.

Summary

South Korea is divided into five ecoprovinces and sixteen ecoregions. The criteria for ecoprovince classification are ecosystem connectivity and cultural homogeneity. Ecoregions are classified by cluster analysis. The variables used in the analysis are latitude, longitude, seasonal mean temperature, and seasonal precipitation. The large forest fires occurred in the specific ecoregions including Kangwon coastal ecoregion, WoolYoung coastal ecoregion, HyungsanTaehwa coastal ecoregion, Upper Nagdong river basin ecoregion and Southeastern inland ecoregion. The largest forest fire in the Korean history occurred in Kangwon coastal ecoregion in the year 2000. The fire devastated the forestland over 25,000ha. Korea Forest Service, Ministry of Environment, Province Kangwon and NGO organized an investigation committee for the restoration of the burnt area. The committee suggested restoration principles and also forged a restoration strategy of the Kangwon burnt area.